

Recommendations before developing

Tool – Android Studio:

- <https://developer.android.com/studio>

To test the developed apps:

- Real devices:
<https://developer.android.com/studio/run/device>
- Emulator – Android Virtual Devices (AVD):
<https://developer.android.com/studio/run/emulator>

Tutorials from Google (including slides, support material, exercises):

- Android Development Fundamentals:
<https://developer.android.com/courses/fundamentals-training/toc-v2>
- Advanced Android Development:
<https://developer.android.com/courses/advanced-training/overview>

User Experience in Android:

- Material Design:
<https://material.io/develop/android/>

Other relevant References:

- Professional Android 4th Edition, Reto Meier, Ian Lake, 2018:
<https://medium.com/@retomeier/professional-android-4th-edition-c4013f1795f2>

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Aula 1 - Building you first App in Android

Summary:

- Overview
- Create Project
- Run your app
- Build a simple user interface
- Start Another Activity

Follow the Android First app tutorial at:

<https://developer.android.com/training/basics/firstapp/>

Aula 2 - Body Mass Index Program

Summary:

- Constraint Layout example
- Activity and events
- Multiple language support

2.1. Constraint Layout

Create a new project name BMI with and recreate a constraint layout similar to the example given below. You may use the given code and add the necessary constraints to obtain a layout similar to the example.

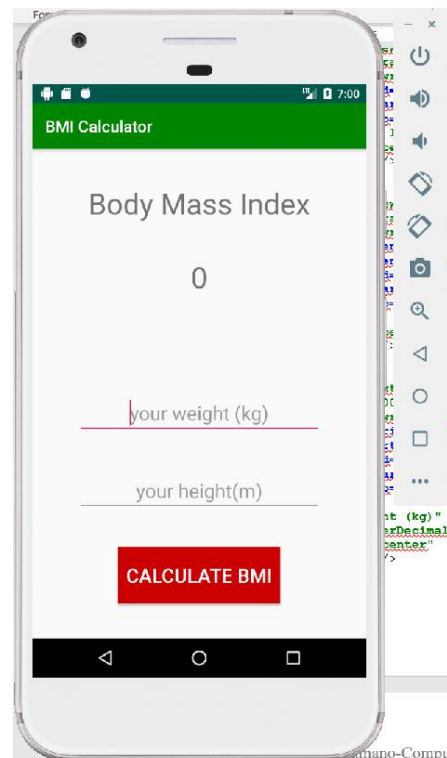
Get more information about constraint layout at:

<https://developer.android.com/guide/topics/ui/declaring-layout>

```
<TextView
    android:id="@+id/textViewTitle"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginEnd="16dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="24dp"
    android:text="Body Mass Index"
    android:textAlignment="center"
    android:textSize="36sp" />

<TextView
    android:id="@+id/textViewResult"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentLeft="true"
    android:layout_alignParentStart="true"
    android:layout_marginEnd="16dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="16dp"
    android:text="0"
    android:textAlignment="center"
    android:textSize="36sp" />

<EditText
    android:id="@+id/editTextWeight"
    android:layout_width="300dp"
    android:layout_height="wrap_content"
    android:layout_centerHorizontal="true"
    android:layout_centerVertical="true"
    android:layout_marginEnd="16dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="64dp"
    android:ems="10"
    android:hint="your weight (kg)"
    android:inputType="numberDecimal"
    android:textAlignment="center"
    android:textSize="24sp" />
```



```
<EditText
    android:id="@+id/editTextHeight"
    android:layout_width="300dp"
    android:layout_height="wrap_content"
    android:layout_marginBottom="16dp"
    android:layout_marginEnd="16dp"
    android:layout_marginStart="16dp"
    android:layout_marginTop="16dp"
    android:ems="10"
    android:hint="your height(m)"
    android:inputType="numberDecimal"
    android:textAlignment="center"
    android:textSize="24sp"/>

<Button
    android:id="@+id/btnCalc"
    android:layout_width="300dp"
    android:layout_height="70dp"
    android:layout_marginBottom="32dp"
    android:layout_marginEnd="16dp"
    android:layout_marginStart="16dp"
    android:background="@android:color/holo_red_dark"
    android:text="Calculate BMI"
    android:textColor="@android:color/background_light"
    android:textSize="24sp"/>
```

2.2. MainActivity

Notice the code in the MainActivity that creates the activity and point to the layout file associated to the activity.

```
public class MainActivity extends Activity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```

More information on activities:

<https://developer.android.com/guide/components/activities/intro-activities>

2.3. OnClick event

Use the OnClick event on the button and adapt the following code to compute the BMI in the application.

<https://developer.android.com/guide/topics/ui/controls/button>

Access to the views:

```
TextView txtResult = (TextView) findViewById(R.id.textViewResult);

EditText txtWeight = (EditText) findViewById(R.id.editTextWeight);
EditText txtHeight = (EditText) findViewById(R.id.editTextHeight);

double weight = Double.parseDouble(txtWeight.getText().toString());
double height = Double.parseDouble(txtHeight.getText().toString());

double result = weight / Math.pow(height, 2);

txtResult.setText(String.format("%.1f", result));
```

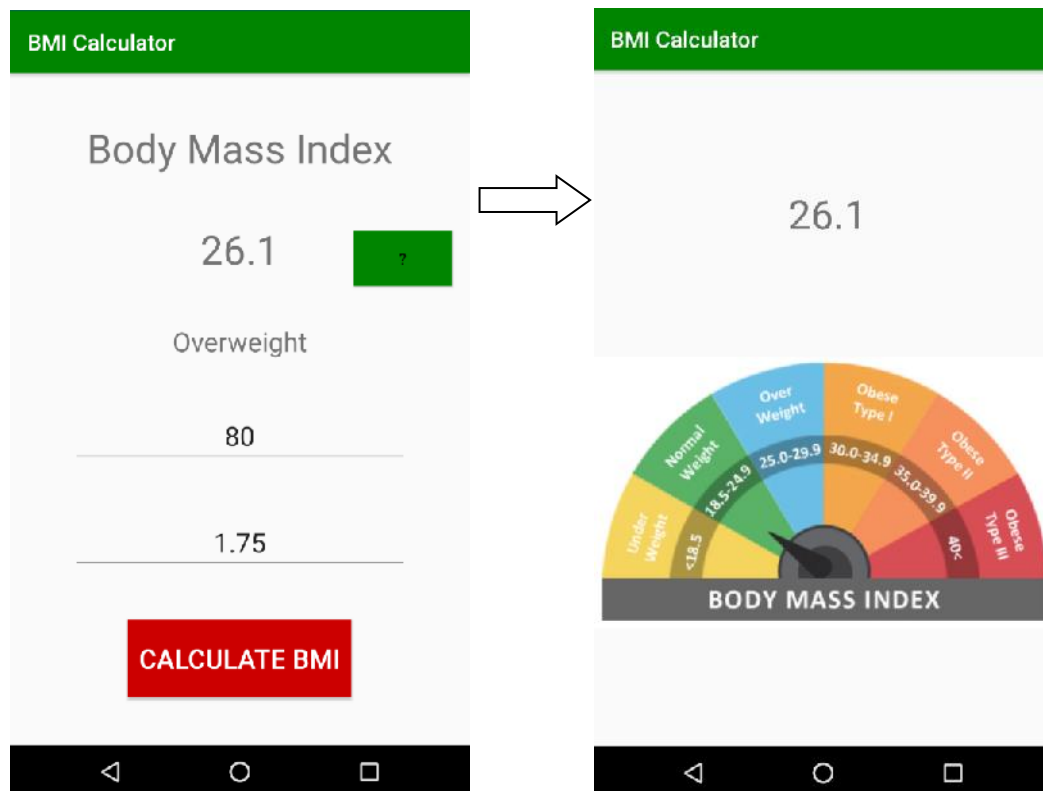
Add the following code after the computation of the BMI index (you may change the first parameter which is the Tag element of the message). Run the program and see if you can find the information in the logcat.

```
Log.d("BMI", "Computed BMI:" + result);
```

You might also set a breakpoint in the line introduced previously (click on margin). Run the application in debug mode and evaluate some of the debugging tools (set over, resume program, watch variables).

2.4. IMC table

Add the possibility to see the type of IMC class according to the chart in bmi_chart_img.jpg by adding a textView and the correct tests in the MainActivity.



Add a help button to view the table in a new Activity. Create a new Activity with the BMI value and IMC Table to be showed when clicking in the button help.

Note that you have to add the images needed to the project (namely the available bmi_chart_img.jpg image to the res/drawable directory) before you can associate them to an imageView in the layout.

To open a new activity, you need to define an intent and associate it to an activity.

```
Intent intent = new Intent(this, newActivity.class);
startActivity(intent);
```

To associate data to the new activity you may adapt the following code:

In the parent activity:

```
intent.putExtra("imcResult", txtResult.getText());
```

In the child Activity:

```
Intent intent = getIntent();
Bundle extras = intent.getExtras();

if(extras != null) {
    txtResult = (TextView) findViewById(R.id.textViewIMC);
    txtResult.setText( extras.getString("imcResult") );
}
```

More information on intents:

<https://developer.android.com/guide/components/intents-filters>

2.5. Multiple language support

Add the relevant key in the strings.xml file and associate them to the correct Views.

Add the necessary translation to handle Portuguese (or another language) and test the result in the design view (change the language).

<https://stackoverflow.com/questions/37747509/adding-new-locales-and-forcing-a-locale-in-an-android-app-localization>

<https://developer.android.com/training/basics/supporting-devices/languages>

Key	Resource ...	Untransla...	Default Value	Portuguese (pt) in Portugal (PT)
app_name	app\src\m	<input type="checkbox"/>	BMI Calculator	Calculo BMI
title	app\src\m	<input type="checkbox"/>	Body Mass Index	Indice Massa Corporal
result	app\src\m	<input checked="" type="checkbox"/>	0	
help	app\src\m	<input checked="" type="checkbox"/>	?	
weight	app\src\m	<input type="checkbox"/>	your weight (kg)	peso (kg)
height	app\src\m	<input type="checkbox"/>	your height (m)	altura (m)
calculateBMI	app\src\m	<input type="checkbox"/>	Calculate	Calcula IMC
table1	app\src\m	<input type="checkbox"/>	Low weight	Baixo Peso
table2	app\src\m	<input type="checkbox"/>	Adjusted	Adequado
table3	app\src\m	<input type="checkbox"/>	Overweight	Sobrepeso
table4	app\src\m	<input type="checkbox"/>	Obese class 1	Obesidade Classe 1
table5	app\src\m	<input type="checkbox"/>	Obese class 2	Obesidade Classe 2
table6	app\src\m	<input type="checkbox"/>	Obese class 3	Obesidade Classe 3

More information:

<https://developer.android.com/training/basics/supporting-devices/languages>